Distributed Energy Resources and Technologies

State Energy Conservation Office
Comptroller of Public Accounts

Distributed Energy Roadshow
Austin Energy
May 30, 2003

Distributed Energy Technologies

- **Reciprocating Diesel or Natural Gas Engines**
- **Microturbines - small-scale distributed power generation in the 30-400 kW size range**
- **Combustion turbines - peaking unit and combined heat and power (CHP) applications.**
- **Fuel Cells**
- **Solar Energy/Photovoltaics**
- **Wind**

Roles of Distributed Energy Resources

- Economic potential
- Energy reliability
- Stabilize long term energy costs
- Non-attainment or near non-attainment areas emission reductions

Reasons to consider DER

- **Customer Generation**
- **Cogeneration** (CHP)
- **Peak Shaving**
- **Selling Power to the Grid Under Net Metering**
- **Standby/Emergency Generation**
- **Premium Power** (quality & reliability)
- **Green Power**
- **Remote Power**

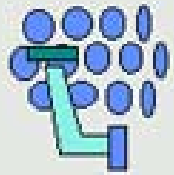
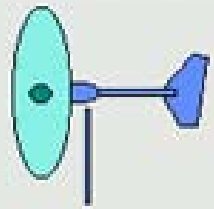
Things to consider

- Cost/Value
- Efficiency
- Reliability
- Reduced Emissions
- Applications
- Increased Maintenance
- Specialized Training
- Regulatory/Policy
- Barriers
- Technology

Status of the Technologies

Technology	Recip Engine: Diesel	Recip Engine: NG	Microturbine	Combustion Gas Turbine	Fuel Cell
Size	30kW - 6+MW	30kW - 6+MW	30-400kW	0.5 - 30+MW	100-3000kW
Installed Cost ($/kW)[1]	600-1,000	700-1,200	1,200-1,700	400-900	4,000-5,000
Overall Efficiency[2]	~80-85%	~80-85%	~80-85%	~80-90%	~80-85%
Total Maintenance Costs[3] ($/kWh)	0.005 - 0.015	0.007-0.020	0.008-0.015	0.004-0.010	0.0019-0.0153
Emissions	NO_x: 7-9 CO: 0.3-0.7	NO_x: 0.7-13 CO: 1-2	NO_x: 9-50ppm CO: 9-50ppm	NO_x: <9-50ppm CO:<15-50ppm	NO_x: <0.02 CO: <0.01

Status of the Technologies

Status of the Technologies	 Photovoltaics	 Solar Thermal	 Small Wind
Status	Commercial	Demo	Commercial
Installed Cost	$ 8 / Watt	$ 10 / Watt	$ 3.20 / Watt
Payback Period	30 Years	30+ Years	15 Years
Cost Potential	$ 3 in 2010	?	$ 1.50 in 2010
Typical Site	Suburban	Southwest	Rural
Available Resources	Poor - Good	Poor - Good	Poor - Great

SECO Demonstration Projects

Texas Solar
for Schools

- 2 kW
- Hands-on education
- Urban setting

SECO Demonstration Projects

- 56 kW system will reduced emissions

- 20 kW - is providing peaking shaving

SECO Demonstration Projects

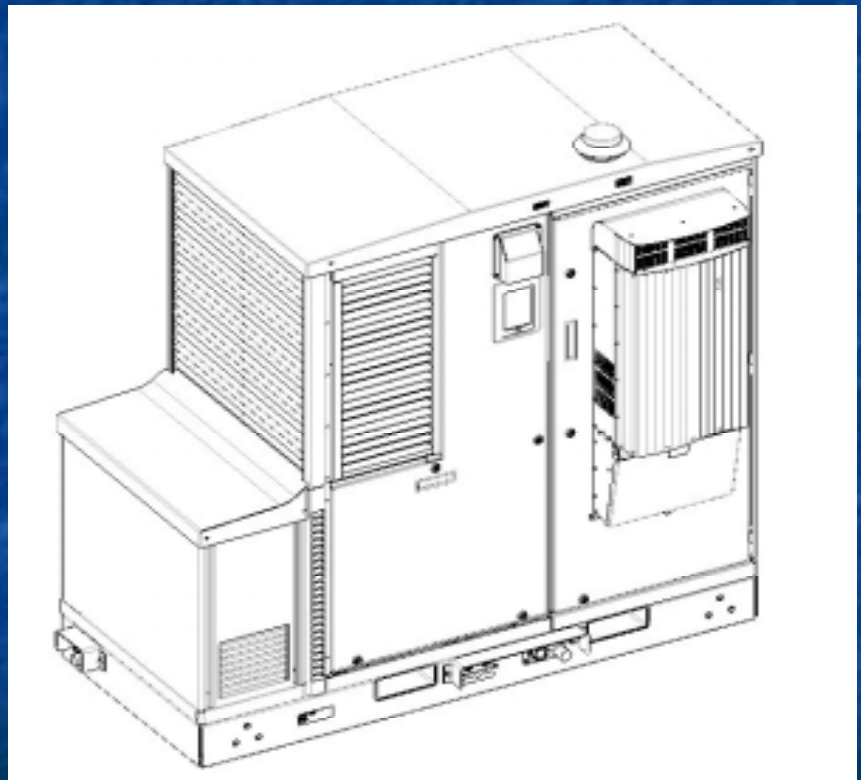
Small – Scale Wind Energy Road Side Rest Area

- 10 kW
- Remote location
- Visual interest

SECO Demonstration Projects

- Proton Exchange Membrane (PEM) Fuel Cell

Back-up power at DFW airport



Are you interested in DER

Texas Public Utility Commission –

Distributed Generation Interconnection Manual May 2002

- http://www.puc.state.tx.us/electric/projects/21965/dgmanual.doc

Texas Commission on Environmental Quality –

Air Quality Standard Permit for Electric Generating Units

- http://www.tnrcc.state.tx.us/permitting/airperm/nsr_permits/files/segu_final.pdf

For more information on
demonstration projects
please contact:

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